



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/808,160

03/23/2004

Laurent Vandroux

A8815/T54400

4812

7590

01/03/2005

Patent Counsel, M/S 2061
APPLIED MATERIALS, INC.
Legal Affairs Department
P.O. Box 450A
Santa Clara, CA 95052

EXAMINER

LEE, CALVIN

ART UNIT

PAPER NUMBER

2825

DATE MAILED: 01/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,160

Applicant(s)

VANDROUX et al.

Examiner

Lee, Calvin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 and 13-20 is/are rejected.
- 7) ☒ Claim(s) 12,21 and 22 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: ____.

DETAILED ACTION

Claim Rejections - 35 U.S.C. § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office Action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Note: This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a)

2. Claims 1-8, and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by *Rogers, Jr. et al* (US 4,590,091).

Rogers, Jr. et al disclose a method of forming an oxide layer over a germanium substrate:
-providing a first plasma to a process chamber to react with GeO₂ in a germanium substrate (to reduce the oxide contamination) [col. 10, ln.31], wherein the first plasma uses a treatment gas containing nitrogen and hydrogen-containing gas “comprising a mixture of H₂/N₂”
-thereafter, generating a second plasma from a protective-layer gas that comprises a flow of silane and nitrous oxide [col. 9, ln.31] and providing the second plasma to the process chamber to deposit a protective SiO₂ layer over the germanium substrate

In re claim 4, *Rogers, Jr. et al* further discloses heating the germanium substrate to a temperature less than about 550°C [col. 4, ln.48].

Claim Rejections - 35 U.S.C. § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Rogers, Jr. et al*, as applied to claim 1, in view of *Yim et al* (US 2003/0139035).

Rogers, Jr. et al suggests the hydrogen-containing gas comprising hydrogen but not ammonia. *Yim et al* discloses, “the pre-treatment with a hydrogen plasma may remove metal oxides, such as copper oxide, from the substrate surface. It was found that substrates including

copper and pre-treated with a hydrogen plasma had a higher reflectivity than substrates including copper and pre-treated with an ammonia plasma” [¶ 0027].

It would have been obvious to one with ordinary skill in the specific art to have modified the hydrogen-containing gas of *Rogers, Jr. et al* by utilizing ammonia treatment for the purpose of obtaining a treated substrate with a lower reflectivity.

4. Claims 11 and 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over *Rogers, Jr. et al* in view of *Lin* (US 2004/0241341).

a) *Rogers, Jr. et al* suggests the protective layer of silicon dioxide but not an amorphous-silicon layer. *Lin* suggests forming an amorphous-silicon layer over a substrate.

It would have been obvious to one of ordinary skill in the art to have modified the protective layer of *Rogers, Jr. et al* by utilizing an amorphous-silicon as a protective layer because amorphous-silicon is easily formed and would be expected to equivalently provide protection as any other of the disclosed protective material. Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 SUPQ 416.

b) *Rogers, Jr. et al* also does not disclose depositing an oxide layer over the protective amorphous-silicon layer. *Lin* discloses performing an oxygen-containing plasma treatment on the amorphous-silicon layer to transform a portion of the amorphous-silicon layer to a superficial oxide layer [¶ 0013]. It would have been obvious to one of ordinary skill in the art to have modified the protective layer of *Rogers, Jr. et al* by utilizing/forming an oxide layer over the protective amorphous-silicon layer for the purpose of fulfilling a need of the underlying amorphous silicon layer [see ¶ 0005 in *Lin*].

c) In re claim 18, *Rogers, Jr. et al* discloses “higher temperatures may be advantageous in order to enhance the rate of the native oxide reduction reaction” [col. 4, ln.48] and suggests “the substrate was heated to 150C” [col. 5, ln.42], but does not suggest explicitly heating the germanium substrate to a temperature between 350 and 550 C.

It would have been obvious to one having ordinary skill in the art to have modified the treatment of *Rogers, Jr. et al* by utilizing the claimed temperatures because one would either adjust the plasma pressure or raise the plasma RF power to result in the most effective plasma treatment.

Allowable Subject Matter

5. Claims 12 and 21-22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims because none of the cited arts teaches or suggests the second plasma performed without or with terminating the first plasma.

Contact Information

6. Any inquiry concerning this communication from the Examiner should be directed to *Calvin Lee* at (571) 272-1896, Monday to Thursday, from 7 to 5 (ET). If attempts to reach the examiner by telephone are unsuccessful, Art Unit 2825's Supervisory Patent Examiner *Matthew Smith* whose telephone number is (571) 272-1907.

Any inquiry relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0596. The central fax number is (703) 872-9306 for all communications to be entered (e.g., amendments, remarks, IDS, etc.)



December 23, 2004